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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,418	02/26/2004	Peter G. Bowles	124-1071	2793

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EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	PAPER NUMBER
1745	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/21/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/786,418	BOWLES ET AL.	
	Examiner	Art Unit	
	Tony Chuo	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-21 and 23-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-21 and 23-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Claims 1-4, 6-21, and 23-30 are currently pending. Claims 5 and 22 have been cancelled. New claim 30 has been added. Claims 1-4, 6-21, and 23-30 do not overcome the previously stated 102 and 103 rejections. Therefore, the previously stated 102 and 103 rejections are maintained. This action is made FINAL as necessitated by the amendment.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 6-15, 17-21, and 23-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Giwa et al ("Scale-Up of Lithium/Carbon Monofluoride Envelope Cells", Proceedings of the 39th Power Sources Conference, June 2000, pg 32-35). Regarding claim 1, 4, 12, 13, 19, 21, 26, and 27, the Giwa reference discloses a pouch battery and a method of making the pouch battery comprising: a primary lithium/solid cathode cell

where the cathode is a carbon monofluoride; an assembly formed by respectively overlaying a sheet cathode, a sheet separator, and a lithium metal sheet anode to form a stacked structure and subjected to 1 to 5 folds wherein the initial fold comprises folding the cathode sheet around a central lithium anode; and forming a pouch battery by sealing the electrode assembly in a Surlyn bag (See Introduction, Experimental, and Cell Construction). Since the cathode sheet was folded around a central lithium anode, the cathode would be folded in half around a double-sided anode sheet so as to surround the respective upper and lower active anode surfaces such that the fold line extends perpendicular to its length. Therefore, the anode sheet is half the size of the cathode sheet.

Regarding claims 2, 14-15 and 17, it is well known in the art that a double-sided anode comprises a single sheet current collector combined with either a single layer of lithium metal or two layers of lithium metal that form the upper and lower active surfaces to form a single integral anode. Since the anode sheet is half the size of the cathode sheet, the dimensions of the anode current collector match those of the cathode when folded in half.

Regarding claims 3, the cathode and separator would have to be the same size and shape in order to prevent an electrical short between the anode and cathode.

Regarding claim 6, 7, and 23, it also discloses folding the cell 5 times, starting with a sheet that is 240 x 7.5 cm and ending with a folded construction that is 7.5 x 7.5 cm (See Cell Construction). Therefore, four subsequent folds were made upon the same side of the stacked structure with the fold line extending perpendicular to the

original length of the stacked structure and its overall length is halved at each fold.

Regarding claim 8, it also discloses a battery capacity that exceeds 18 Ah (See Capacity and Energy Density table in Discussion of Results).

Regarding claims 9 and 10, it also discloses a cathode that comprises an aluminum sheet current collector and a cathode material layer where the cathode has active surface on only one side thereof, formed by the cathode material layer (See Experimental).

Regarding claims 11 and 24, it also discloses total cathode and anode capacities that are roughly matched to produce a balanced cell (See Cell Construction).

Regarding claim 18 and 25, it also discloses the cathode capacity/cm^2 is about half that of the anode capacity/cm^2 (See Experimental).

Regarding claim 20, it also discloses an electrolyte filling stage (See Cell Construction).

Regarding claim 28, it also discloses a pouch battery in which the cathode, separator, and anode sheets have been respectively overlaid on one another to form a stacked structure, and the structure has been folded in half so that its length is halved at each fold, each fold being made on the same side of the structure with the fold lines extending perpendicular to the original length (See Experimental and Cell Construction).

Regarding claim 29, it also discloses a primary lithium/solid cathode pouch battery comprising an electrode assembly formed by respectively overlaying a sheet cathode, a sheet separator and a double-sided sheet anode to form a stacked structure, and subjecting the stacked structure to multiple folds, wherein the initial fold comprises

folding the cathode in half around the double-sided anode so as to surround the respective upper and lower active anode surfaces thereof, and wherein one or more successive folds comprises folding the stacked structure so its overall length is halved with each fold, the fold lines being made perpendicular to that length (See Introduction, Experimental, and Cell Construction).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 16 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giwa et al ("Scale-Up of Lithium/Carbon Monofluoride Envelope Cells", Proceedings of the 39th Power Sources Conference, June 2000, pg 32-35) in view of Aamodt et al (US 2003/0194604). The Giwa reference is applied to claims 1, 14, and 15 for reasons stated above. In addition, Giwa et al also discloses a central lithium anode which inherently is double-sided. However, Giwa et al does not expressly teach a current collector in the form of a mesh or grid with the lithium foil occupying the openings to form a double sided lithium anode. The Aamodt reference discloses a metal grid that functions as a current collector that forms a cohesive bond between two lithium foils that could be used to form a double-side lithium anode (See paragraph [0013]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was

made to modify the Giwa battery to include a current collector in the form of a mesh or grid with the lithium foil occupying the openings to form a double sided lithium anode in order to stabilize and reinforce the cohesive bond between the lithium foils.

Response to Arguments

7. Applicant's arguments filed 10/3/06 have been fully considered but they are not persuasive.

The applicant argues that the Giwa reference discloses each fold that is 7.5 x 7.5 cm which implies a method such as a zig-zig folding, where the folds are of equal size. The examiner disagrees with this interpretation of the Giwa reference. For a cell that has 5 folds of equal size where each fold is 7.5 x 7.5 cm, the resulting cell would have an active area of 45 x 7.5 cm. This analysis would disagree with the cell being folded 5 times to give an active area of 240 x 7.5 cm. Therefore, the only logical method of folding the electrodes is to start with electrodes that have an active area of 240 x 7.5 cm and then fold the electrodes five times with each fold made with the fold line extending perpendicular to the original length of the stacked structure so that its overall length is halved at each fold until the reaching the final area of 7.5 x 7.5 cm.

The applicant also argues that the Aamodt reference does not teach a double-sided lithium anode in the form of a mesh or grid. The Aamodt reference does teach the concept of stabilizing and reinforcing two lithium foils with a metal grid that is used as a current collector.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

SUSY TSANG-FOSTER
PRIMARY EXAMINER